

From: [TARNOW Karen E](#)
To: [Kristine Koch/R10/USEPA/US@EPA](#); [Chip Humphrey/R10/USEPA/US@EPA](#); [Eric Blischke/R10/USEPA/US@EPA](#)
Subject: FW: PCB mass balance
Date: 05/17/2010 08:23 AM

Hey folks – FYI

See below for a more complete question to an answer I asked at the modeling workshop.

From: Carl Stivers [mailto:cstivers@anchorqea.com]
Sent: Friday, May 14, 2010 7:48 AM
To: TARNOW Karen E
Cc: Michael Werth; Kevin Russell; Amanda Shellenberger
Subject: RE: PCB mass balance

Karen -

The short answer to your question is that the RI loading analysis only focused on “external” loads to the study area, and did not consider “internal” exchanges in the system (with the exception of groundwater advection). These internal processes that were not considered in the RI are porewater exchange and sediment erosion.

One way to demonstrate that the RI did not consider these processes is to look at the overall mass balance for tPCB using the values calculated in the RI -- the overall mass balance for tPCB presented in the RI does not “close”. That is, when one sums the water column sources and subtract the sinks, the total load calculated from those terms is lower than the load that is estimated from the water column data at the downstream end of the study area. For example, the RI shows (see Figure 10.2-3) that the tPCB load approximately doubles from the upstream end of the study area to RM 4 – the data-based calculations from the RI do not fully account for this load increase. Thus, you need an additional flux to the river in order to explain the observed load gain in the water column across the study area – that process is pore water exchange from the sediment bed. Sediment erosion from the bed also contributes. Since porewater exchange and erosion is included in the model, this enables the model to capture the doubling of the water column load across the study area.

In addition, the data-based loads calculated in the RI agree quite well with the model for the processes that can be matched (e.g., load from upstream, stormwater, groundwater). You can’t assess this from the modeling presentation since we only presented the terms on a relative basis.

Hopefully this answers your question. If you would like any additional information, please let us know.

Thanks.

Carl (on behalf of the Anchor QEA modeling team that worked on this response).

Carl Stivers

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From: TARNOW Karen E [mailto:TARNOW.Karen@deq.state.or.us]
Sent: Wednesday, May 05, 2010 2:39 PM
To: Carl Stivers
Subject: PCB mass balance

Hi Carl –

I asked this yesterday but still am not sure I understand what is going on here. In simple terms (?), can you help me understand why the relative proportion of the PCB load associated with the pore water (per model) is so much more significant than the calculated load in the RI Figure 10.2-2?

Seems like there must have been something very different about the method for calculating the load in the RI as compared to how it is done in the model. Was it the advection rate? Sediment depth? Etc.

Thanks

Karen

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